

## REMARKS

In the Office Action of April 21, 2006 ("Office Action"), Examiner rejected Claims 1-6, 8-11, 14-20 & 22-24 under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent 5,990,928 ("Sklar") in view of U.S. Patent 6,018,659 ("Ayyagari"), and U.S. Patent 5,537,122 ("Eguchi").

Please note that although on page 3, first paragraph of the Office Action, Examiner states that Claims 1-6, 8-11, 14-20 & 22-24 are being rejected over Sklar, Ayyagari, and Eguchi. Examiner then goes on to reference U.S. Patent 5,764,185 ("Fukushima") in connection with such rejection. See Office Action page 5, first and second paragraphs, and page 6, first paragraph.

Examiner rejected Claims 7 & 21 under 35 U.S.C. §103(a) as being unpatentable over Sklar, Ayyagari, Fukushima & Eguchi, further in view of U.S. Patent 5,526,022 ("Donahue"). Also, Examiner rejected Claim 13 under 35 U.S.C. §103(a) as being unpatentable over Sklar, Ayyagari, Fukushima, Eguchi & U.S. Patent 6,166,686 ("Lazar").

Applicant respectfully traverses the rejections and submits the following arguments. Applicant will demonstrate that the unclear reliance on Fukushima in forming a basis for a 35 U.S.C. §103(a) rejection was inappropriate. Applicant will then demonstrate that there is no motivation to make the combinations of references proposed by Examiner in Examiner's rejection of the independent claims, Claims 1, 11 and 17, and that Eguchi positively teaches away from the combination proposed by Examiner. Applicant will then demonstrate how several of the dependent claims should be allowed on grounds independent from those of the independent claims.

### Use of Fukushima in 35 U.S.C. §103(a) Rejections

In Applicant's previous Amendment and Response dated January 30, 2006, Applicant argued that Examiner misinterpreted the way in which Fukushima initiated closed-loop control. Applicant presented extensive evidence and detailed arguments explaining how Fukushima does not initiate closed-loop control based on a received signal level, but instead uses estimated error levels accumulated during open-loop operation to determine when to initiate closed-loop control. In response to this argument, Examiner stated, "Applicant's arguments with respect to claims have been considered but are moot in view of the new ground(s) of rejection." Office Action page 2, second paragraph. Examiner does not list Fukushima as a basis for a 35 U.S.C. §103(a) rejection when

listing the prior art relied upon for the 35 U.S.C. §103(a) rejection in the first paragraph of the Office Action on page 3.

However, despite these express statements, Examiner then goes on to use Fukushima as a 35 U.S.C. §103(a) reference in the rejection of Claims 1-6, 8-11, 14-20 & 22-24, which include all three independent claims (Claims 1, 11 and 17). See Office Action page 5, first and second paragraphs, and page 6, first paragraph. Therefore, since Examiner previously stated that arguments regarding the use of Fukushima as a 35 U.S.C. §103(a) reference are moot, the use of Fukushima to reject Claims 1-6, 8-11, 14-20 & 22-24 was inappropriate. In this regard, Examiner has not put forth an argument for a combination of references that teaches each and every element of Applicant's Claims 1-6, 8-11, 14-20 & 22-24. Accordingly, these Claims are in condition for allowance. And since Claims 7, 13 and 21 depend on independent Claims 1, 11 and 17 respectively, all pending claims (Claims 1-11 and 13-24) are in condition for allowance.

For the record, if Examiner intends to maintain his reliance on Fukushima, Applicant respectfully requests that Examiner specify each and every point as to why he is maintaining reliance on Fukushima and specifically address Applicant's arguments regarding Fukushima, including Applicant's previously submitted arguments regarding Fukushima contained in Applicant's January 30, 2006 Amendment and Response, including Applicant's arguments under the heading "Interpretation of Fukushima Closed-Loop Control Initiation" contained on pages 9-15 of Applicant's January 30, 2006 Amendment and Response. Applicant respectfully notes that the MPEP states, "Where the applicant traverses any rejection, the examiner should, if he or she repeats the rejection, take note of the applicant's argument and answer the substance of it." MPEP 707.07(f), third paragraph.

Applicant's previously submitted arguments clearly demonstrate that Fukushima does not teach closed-loop operation activated and terminated on the basis of signal level as claimed by Examiner in the Office Action on page 5, second paragraph. In this regard, the 35 U.S.C. §103(a) rejection using Fukushima is inappropriate and Claims 1, 11 & 17 are in condition for allowance. Accordingly, since Claims 2-10, 13-16 and 18-24 are dependent on Claims 1, 11, and 17 respectively, these claims are also in condition for allowance. Therefore, Applicant respectfully requests that the 35 U.S.C. §103(a) rejections of Claims 1-11 and 13-24 be withdrawn.

Rejection of Claims 1, 11, & 17 under 35 U.S.C. §103(a) over Sklar in view of Ayyagari and Eguchi: Motivation-Suggestion-Teaching

The systems of Claim 1, 11 and 17 are low-cost and low profile due to the combinative utilization of a one-dimensional electronically-pointable antenna and a motorized turntable to achieve two-dimensional pointing and enhanced signal receipt due to the combinative employment of (i) a signal lock and closed-loop feedback system for pointing the antenna during closed-loop operation, and (ii) the inclusion of an orientation system and controller for providing position control data to point the antenna during open-loop operation (e.g. during start-up operation and/or periods when there is no signal lock). The prior art fails to anticipate or render obvious such an arrangement.

In particular, Sklar fails to disclose a one-dimensional electronically-pointable antenna, much less the combinative utilization of a one-dimensional electronically-pointable antenna mounted upon a motorized turntable to provide two-dimensional pointing. Also, Sklar fails to disclose any closed-loop operation and hence also fails to disclose a signal lock for automatically activating and deactivating a closed-loop feedback system in response to received signal strength.

Examiner cites Ayyagari to provide a one-dimensional electronically-pointable antenna to be combined with Sklar. Yet neither Sklar nor Ayyagari suggest such a combination. Neither reference provides motivation for the alteration of their respective disclosed antenna structures.

Eguchi fails to disclose, *inter alia*, a system capable of switching between closed-loop and open-loop operation based on received signal strength. To the contrary, Eguchi uses a hybrid antenna control system based on signal strength and an angular rate sensor. Eguchi specifically states, “mode transition control signal is not required in the hybrid tracking system of the present invention because the closed-loop tracking signal and the rate sensor output (high pass filtered) for open-loop control are always mixed (except for the SEARCH-mode).” Eguchi column 3, lines 12-16 (emphasis added). Therefore, since Eguchi does not operate using exclusively closed-loop control, it is inappropriate to combine Sklar (a reference which does not disclose any closed-loop control) and Eguchi (a reference that does not disclose operating exclusively with closed-loop control) to form the basis for a 35 U.S.C. §103(a) rejection of Applicant's claims, which in fact do claim systems capable of operating in an exclusively closed-loop mode. Additionally, since Eguchi only uses a single rate sensor, Eguchi is incapable of open-loop tracking upon startup or if no signal is received for a

predetermined amount of time and must resort to a search mode where the array antenna is forcibly steered around the azimuth axis until a signal is detected. Eguchi column 6, lines 44-60.

Sklar fails to provide any suggestion or motivation to combine the teachings thereof with Eguchi. Sklar teaches an open-loop control system and does not discuss any other methods of control. Sklar provides no motivation for a combination with any other reference with regard to antenna control, much less in a manner that would yield the systems of Applicant's Claims 1, 11 and/or 17. For example, Sklar does not suggest that the described open-loop control system is inadequate or lacking in any respect.

As for Eguchi, it teaches the benefits of its hybrid open-loop/closed-loop tracking system stating that it has the benefit of realizing "a low-cost hybrid antenna control system without time lag for transition (from closed-loop control to open-loop control, or vice versa)." Eguchi column 3, lines 9-12. Clearly this teaches away from using open-loop control separately from closed-loop control as in Applicant's Claims 1, 11 and 17.

For the record, and as previously stated by Applicant, as general reference and particularly in reference to Examiner's combination of Sklar, Ayyagari, Eguchi and Fukushima discussed above, Applicant notes that the prior art must teach or otherwise motivate a combination of prior art references. For example, in the CAFC decision of *In re Anita Dembiczak and Vincent Zinbarg*, 175 F.3d 994, U.S.P.Q.2D (BNA) 1614 (Fed. Cir. 1999) the Court stated:

Our case law makes clear that the best defense against the subtle but powerful attraction of a hindsight-based obviousness analysis is rigorous application of the requirement for a showing of the teaching or motivation to combine prior art references. See, e.g., *C.R. Bard, Inc. v. M3 Sys., Inc.*, 157 F.3d 1340, 1352, 48 U.S.P.Q.2D (BNA) 1225, 1232 (Fed. Cir. 1998) (describing "teaching or suggestion or motivation [to combine]" as an "essential evidentiary component of an obviousness holding"); *In re Rouffet*, 149 F.3d 1350, 1359, 47 U.S.P.Q.2D (BNA) 1453, 1459 (Fed. Cir. 1998) ("the Board must identify specifically...the reasons one of ordinary skill in the art would have been motivated to select the references and combine them"); *In re Fritch*, 972 F.2d 1260, 1265, 23 U.S.P.Q.2D (BNA) 1780, 1783 (Fed. Cir. 1992) (examiner can satisfy burden of obviousness in light of combination "only by showing some objective teaching [leading to the combination]"); *In re Fine*, 837 F.2d 1071, 1075, 5 U.S.P.Q.2D (BNA) 1596, 1600 (Fed. Cir. 1988) (evidence of teaching or suggestion "essential" to avoid hindsight); *Ashland Oil, Inc. v. Delta Resins & Refractories, Inc.*, 776 F.2d 281, 297, 227 U.S.P.Q. (BNA) 657, 667 (Fed. Cir. 1985) (district court's conclusion of obviousness was error when it "did not elucidate any factual teachings, suggestions or incentives

from this prior art that showed the propriety of combination"). See also *Graham*, 383 U.S. at 18, 148 U.S.P.Q. (BNA) at 467 ("strict observance" of factual predicates to obviousness conclusion required). Combining prior art references without evidence of such a suggestion, teaching, or motivation simply takes the inventor's disclosure as a blueprint for piecing together the prior art to defeat patentability--the essence of hindsight. See, e.g., *Interconnect Planning Corp. v. Feil*, 774 F.2d 1132, 1138, 227 U.S.P.Q. (BNA) 543, 547 (Fed. Cir. 1985) ("The invention must be viewed not with the blueprint drawn by the inventor, but in the state of the art that existed at the time."). In this case the Board fell into the hindsight trap.

Applicant respectfully submits that the Examiner's combination of Sklar, Ayyagari, Eguchi and Fukushima is improper because, *inter alia*, no suggestion teaching or motivation to combine the references is provided by the references. Indeed, as discussed above with respect to Eguchi, the reference teaches away from combining the references.

In view of the foregoing, Applicant respectfully asserts that Claims 1, 11 and 17 are in condition for allowance and requests that Examiner withdraw the §103(a) rejection of Claims 1, 11 and 17. Dependent Claims 2-10, 13-16 and 18-24 are also allowable for the same reasons as the independent claims on which they are dependent. Furthermore, Claims 2-10, 13-16 and 18-24 are allowable based on further combinative features not taught by the cited prior art. By way of particular example, Claims 2 and 19, Claim 9, Claims 10 and 23, Claim 18 and Claim 24 will be further addressed below.

*Rejection of Claims 2 and 19 under 35 U.S.C. §103(a) over Sklar in view of Ayyagari and Eguchi*

Claim 2 is non-obvious and has significant advantages over the prior art cited by Examiner. Claim 2 claims a flat turntable, a one-dimensional electronically-pointable antenna conformally mounted to the turntable, wherein the turntable is operable to be conformally mounted to a flat surface of a vehicle. This configuration has the advantage of "a substantially flat physical profile...." Original Application page 9, lines 19-20. Such an arrangement is "capable of being installed on the roof of a car, truck, boat, airplane or other mobile craft with little or no adverse affect on vehicle aerodynamics." Original Application page 9, lines 15-17.

Claim 19 similarly claims that the one dimensionally electronically-pointable antenna and turntable are flat and operable to be conformally mounted to a surface of a vehicle. In the Office Action, Examiner rejected Claims 2 and 19 by stating, "see Fig. 5A & 5B in Eguchi." Office Action

page 5, third paragraph. Applicant respectfully asserts that rejection of Applicant's Claim 19, which claims that the turntable and antenna are conformal to a surface of a vehicle, was inappropriate. Figures 5A and 5B of Eguchi clearly illustrate a system where the turntable 12 and the antenna 64 are not conformal to a surface of a vehicle. The system illustrated in Eguchi elevates the turntable 12 a significant vertical distance over the radome base 28. The radome base 28 presumably could be mounted to a surface of a vehicle. This vertical distance is required by Eguchi due to the placement of components between the radome base 28 and the turntable 12, such as the drive belt 16 for the turntable 12 and the receiver front-end 30. Furthermore, components are then placed on top of the turntable 12, necessitating the need for a radome 34 with vertical sidewalls and a curved top. In this regard, Applicant's claimed configurations of Claims 2 and 19 are operable to be conformally mounted to a vehicle and are significantly more aerodynamic than the systems illustrated in Eguchi Figures 5A and 5B. Furthermore, the systems illustrated in Eguchi Figures 5A and 5B could not be mounted conformally to a surface of a vehicle due to their considerable vertical thickness. Therefore, since Eguchi does not disclose a turntable and antenna that are operable to be conformally mounted to the surface of a vehicle, the cited references used in the rejection of Claim 19 do not disclose each and every element of the claim.

As discussed above, Applicant believes that Claims 2 and 19 should be placed in condition for allowance because they are dependent on an allowable independent claims. Applicant also asserts that Claims 2 and 19 should be placed in condition for allowance on the aforementioned independent grounds. Accordingly, Applicant respectfully requests that the 35 U.S.C. §103(a) rejection of Claims 2 and 19 be withdrawn.

*Rejection of Claim 9 under 35 U.S.C. §103(a) over Sklar in view of Ayyagari and Eguchi*

Applicant respectfully asserts that the Examiner misinterprets Eguchi and then misapplies the reference in the rejection of Claim 9. Applicant's Claim 9 claims a signal lock detector adapted for, inter alia, detecting signal loss and activating open-loop operation in response to the detected signal loss. First, Applicant will show that Eguchi discloses no separate open-loop mode and therefore is incapable of activating a separate open-loop mode in response to detected signal strength. In fact, Eguchi makes no changes to its control methodology whatsoever when a signal is first lost. Second,

when Eguchi does switch modes, it is due to an extended loss of signal and the mode switched to is a search mode and not an open-loop control mode.

Eguchi discloses the ability to operate in two distinct modes: search mode and tracking mode. Since the system of the Eguchi does not contain any orientation or position sensors, when no signal is received the system must enter into a search mode where “the array antenna 10 [is] forcibly or semi-forcibly steered around the AZ the axis 18.” Eguchi column 6, lines 45-46. In other words, the search mode of Eguchi involves spinning the turntable until a signal is found. This is not an open-loop control system.

The other mode disclosed by Eguchi is tracking mode. In tracking mode, two distinct signals are used to control the aiming of the antenna. Both of these signals are continuously fed into the beam switch controller 46. The first signal is related to “a difference [that] occurs between the receiving levels which are obtained by using the right and left beams...” Eguchi column 5, lines 52-54. The second signal is from an angular rate sensor that continuously feeds into the beam switch controller 46.

Considering these two modes, applicant now turns to the section of Eguchi cited by the Examiner in the rejection of Claim 9. The first sentence states, “The mode controller 42 activates the search controller 44 while the array antenna 10 is not capturing a target, e.g. immediately after turning on a power supply (search mode).” Eguchi column 6, lines 19-22. This describes the search mode, which is used to capture a signal when no signal is present. The second sentence of the passage cited by Examiner states, “When the array antenna 10 is capturing a target and when the signal from the target is temporarily stopped or blocked due to burst transmission or blocking, the mode controller 42 activates the beam switch controller 46 (tracking mode).” This describes the two instances where the tracking mode is used. The first instance is where the antenna is capturing a target. Under these circumstances the beam switch controller 46 (tracking mode) is active. The second instance is where the target is temporarily blocked. Again, under these circumstances the beam switch controller 46 (tracking mode) is active. In either case tracking mode is used and therefore there is no description of a signal loss and subsequent switching to an open-loop operation as stated by Examiner in the rejection of Claim 9. In other words, Eguchi does not disclose an open-loop mode and consequently Eguchi does not switch to or activate an open-loop mode as claimed in Applicant's Claim 9.

The loss of a signal does not trigger the system in Eguchi to switch modes. If a signal is lost, Eguchi will remain in tracking mode “unless signals as a synchronization detection signal (or SYNCHRO signal) or a receiving level signal are recovered, ... the mode controller 42 generates a mode control signal for commanding the search mode.” Eguchi column 8, lines 5-9. Therefore, Eguchi does not switch modes based on the detected signal strength as asserted by Examiner, but bases the switching of modes on its inability to recover lost signals. This is different than the system of Applicant's Claim 9, which positively switches to an open-loop control based on received signal level.

Since applicant has clearly demonstrated that Eguchi does not contain a signal lock detector adapted for detecting a loss of broadcast satellite signal to activate open-loop operation, the 35 U.S.C. §103(a) rejection of Claim 9 is unsupportable. Therefore, Applicant requests that the rejection of Claim 9 be withdrawn.

*Rejection of Claims 10 & 23 under 35 U.S.C. §103(a) over Sklar in view of Ayyagari and Eguchi*

The passage cited by Examiner in rejection of Claim 10 (Eguchi column 6, lines 44-54) describes the search mode of Eguchi. As stated above, the Eguchi search mode comprises rotating the antenna until a signal is found. This is in no way a closed-loop control and therefore Applicant respectfully asserts that it is inappropriate to use such a reference to reject Applicant's Claims 10 and 23, which claim, inter alia, a closed-loop feedback system adapted for controlling the rotational orientation of the turntable and the look-angle of the electronically-pointable antenna.

Furthermore, Eguchi does not teach using an open or closed-loop system. Eguchi teaches use of a hybrid open/closed-loop control system. In fact Eguchi clearly teaches away from switching between open and closed-loop operation and also teaches away from having separate open and closed-loop control modes. This is stated explicitly in Eguchi, where it is an object of the invention “to realize a low-cost hybrid antenna control system without time lag for transition (from closed-loop control to open-loop control, or vice versa). Actually, mode transition control signal is not required in the hybrid tracking system of the present invention because the closed-loop tracking signal and the rate-sensor output for open-loop control are always mixed....” Eguchi column 3, lines 9-16, emphasis added, parenthetical statements omitted.



The entire point of Eguchi is to avoid switching between open-loop and closed-loop control by using a hybrid control. Therefore, Examiner's statement with respect to Applicant's Claim 10 that in Eguchi, "the closed loop operation also controls the turntable and the look angle of the antenna system" is imprecise in that Eguchi teaches away from using separate open and closed-loop control systems.

Applicant's Claim 23 contains similar subject matter as Applicant's Claim 10. Accordingly, Applicant respectfully requests that the 35 U.S.C. §103(a) rejection of Claims 10 and 23 be withdrawn.

*Rejection of Claim 18 under 35 U.S.C. §103(a) over Sklar in view of Ayyagari and Eguchi*

As stated above in the discussions of the rejections of Claims 9, 10 and 23, Eguchi does not switch between open and closed-loop control modes based on a received satellite signal strength. As previously stated, if a signal is lost, Eguchi will remain in tracking mode and "unless signals as a synchronization detection signal (or SYNCHRO signal) or a receiving level signal are recovered, ... the mode controller 42 generates a mode control signal for commanding the search mode." Eguchi column 8, lines 5-9. Therefore, if a signal is lost in Eguchi, Eguchi may switch between a hybrid open/closed-loop control and a search mode which uses neither open nor closed-loop control. This is not similar to switching between open and closed-loop control based on signal strength (and as discussed above, Eguchi teaches away from such a system) as claimed in Applicant's Claim 18 and therefore should not be part of the basis for a 35 U.S.C. §103(a) rejection.

Accordingly, Applicant respectfully requests that the 35 U.S.C. §103(a) rejection of Claim 18 be withdrawn.

*Rejection of Claim 24 under 35 U.S.C. §103(a) over Sklar in view of Ayyagari and Eguchi*

As discussed above, Eguchi does not contain a separate open-loop control system capable of controlling the turntable and the look angle. Indeed, the two modes disclosed by Eguchi are search mode and tracking mode. Search mode performs no tracking whatsoever. Tracking mode uses a hybrid of open and closed-loop control systems to control the antenna tracking. The open-loop control component of the hybrid open/closed-loop control system of Eguchi uses an angular rate sensor as its only input. Eguchi in no way discloses a sensor that could be used for open-loop control

of a look angle. Absolutely no open-loop control component is discussed in Eguchi that contributes to the control of a look-angle.

Examiner cited 111 lines of text of Eguchi (column 6, lines 5-65 thru column 7, lines 1-50) for his rejection of Applicant's Claim 24, which claims, inter alia, that the open-loop control is capable of controlling the rotational orientation and look-angle of Applicant's antenna. Upon review of the cited material, Applicant asserts that there is no mention whatsoever of look-angle or elevation of the antenna. Furthermore, no open-loop component of the hybrid control of Eguchi is discussed in the cited material. Finally, no open-loop control component for look-angle is ever discussed in Eguchi.

Accordingly, Applicant requests that the 35 U.S.C. §103(a) rejection of Claim 24 be withdrawn or that Examiner specifically elucidate the reasoning behind the citing of Eguchi (column 6, lines 5-65 thru column 7, lines 1-50) in rejecting Applicant's Claim 24.

Conclusion

Based upon the foregoing, Applicant believes that all pending claims are in condition for allowance and such disposition is respectfully requested. In the event that a telephone conversation would further prosecution and/or expedite allowance, Examiner is invited to contact the undersigned.

Respectfully submitted,

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